IN THE CLAIMS:

This Listing of Claims replaces all prior Listings and versions of claims in the above-identified application.

Listing of Claims

1. (Currently Amended) An isolated peptide selected from the group consisting of:

a) a peptide consisting essentially of SEQ ID NO:2;

b) a biologically active fragment of SEQ ID NO:2;

c) a peptide consisting essentially of an amino acid sequence that is at least about 70% identical to SEQ ID NO:2, wherein the peptide has the biological activity of SEQ ID NO:2; and

d) a peptide consisting essentially of an amino acid sequence that differs from SEQ ID NO:2 by ~~at least~~ one substitution, deletion or insertion of an amino acid residue at a position of SEQ ID NO:2 selected from the group consisting of: 1, 2, 5, 6, 9, 10, 11, 12, 13 and 14, wherein the peptide has the biological activity of SEQ ID NO:2.

2. (Original) The isolated peptide of Claim 1, wherein the peptide consists essentially of an amino acid sequence that is at least about 80% identical to SEQ ID NO:2.

3. (Original) The isolated peptide of Claim 1, wherein the peptide consists essentially of an amino acid sequence that is at least about 90% identical to SEQ ID NO:2.

4. (Currently Amended) The isolated peptide of Claim 1, wherein the peptide consists essentially of an amino acid sequence that differs from SEQ ID NO:2 by ~~at least~~ one substitution, deletion or insertion of an amino acid residue at a position of SEQ ID NO:2 selected from the group consisting of: 1, 2, 5, 6, 9, 10, 11 and 12.

5. (Currently Amended) The isolated peptide of Claim 1, wherein the peptide consists essentially of an amino acid sequence that differs from SEQ ID NO:2 by ~~at least~~ one substitution, deletion or insertion of an amino acid residue at a position of SEQ ID NO:2 selected from the group consisting of: 1, 2, 5, 6, 9, 10 and 11.

6. (Original) The isolated peptide of Claim 1, wherein the peptide consists essentially of SEQ ID NO:2.

7. (Original) The isolated peptide of Claim 1, wherein the peptide comprises a modification selected from the group consisting of farnesylation, carboxymethylation, geranyl-geranylation, and complexing with a lipid carrier.

8. (Original) A therapeutic composition comprising the isolated peptide of Claim 1 and a pharmaceutically acceptable carrier.

9-13. (Cancelled)

14. (Original) A therapeutic protein comprising a protein selected from the group consisting of:

a) a protein comprising an amino acid sequence represented by SEQ ID NO:4;

b) a protein comprising biologically active fragment of SEQ ID NO:4; and

c) a protein comprising an amino acid sequence that is at least about 70% identical to SEQ ID NO:4, wherein the protein has prelamin A or lamin A biological activity;

wherein the protein is chemically or recombinantly attached to a therapeutic agent that increases the half-life of the protein in cardiac or skeletal muscle tissue.

15. (Original) A carrier for therapeutic agents for the treatment of cardiac or skeletal muscle disorders, consisting essentially of an isolated fragment of SEQ ID NO:4 with inter-nuclear transport domain biological activity, or a biologically active homologue thereof.

16. (Original) A therapeutic composition for promoting myoblast activation and growth or regeneration of cardiac or skeletal muscle comprising an isolated peptide consisting essentially of the carrier of Claim 15 operatively linked to a therapeutic agent for promoting myoblast activation and growth or regeneration of cardiac or skeletal muscle.

17-22. (Cancelled)

23. (Withdrawn) A method to identify compounds that regulate myoblast activation and differentiation, comprising:

a) contacting a prelamin A protein or a prelamin A pre peptide with a test compound under conditions suitable for binding of the prelamin A protein or prelamin A pre peptide by the test compound; and

b) detecting binding of the prelamin A protein or prelamin A pre peptide by the test compound.

24-37. (Cancelled)

38. (Original) A processing deficient prelamin A peptide, wherein the processing deficient prelamin A peptide consists essentially of an amino acid sequence that differs from SEQ ID NO:4 by at least one substitution, deletion or insertion that results in a decrease in a prelamin A or prelamin A pre peptide biological activity selected from the group consisting of:

a) prelamin A processing to release a prelamin A pre peptide consisting of SEQ ID NO:2 or a biologically active homologue thereof;

b) prelamin A pre peptide signal transduction;

c) synchronization of intercellular signaling with changes in lamin A localization and nuclear lamina morphology that occur early in myoblast differentiation;

d) synchronization of transcriptional regulation of muscle-specific genes or cell cycle arrest that occurs concomitant with myoblast differentiation;

e) formation of normal nuclear lamina structure; and

f) induction of myoblast activation and differentiation.

39. (Currently Amended) The processing deficient prelamin A peptide of Claim 38, wherein the processing deficient prelamin A peptide consists essentially of an amino acid sequence that differs from SEQ ID NO:4 by a substitution of an amino acid residue in SEQ ID NO:4 selected from the group consisting of: Arg60, Leu85, Glu203, Arg89, Asn195,

Arg377, Tyr646, Gly649~~G649~~, Asn650~~N650~~, Pro653~~P653~~, Arg654~~R654~~, Pro658~~P658~~, Gln659~~Q659~~, Asn660~~N660~~, Cys661, Ser662~~S662~~, Ile663~~I663~~ and Met664~~M664~~.

40. (Currently Amended) The processing deficient prelamin A peptide of Claim 38, wherein the substitution is selected from the group consisting of: Arg60Gly, Leu85Arg, Glu203Gly, Arg89Leu, ~~Asn19Lys~~Asn195Lys, and Arg377His.

41. (Cancelled)

42. (Withdrawn) A method to promote myoblast activation and regeneration of damaged, degenerated or atrophied cardiac and skeletal myocytes, comprising administering to a patient that has damaged, degenerated or atrophied cardiac or skeletal myocytes the isolated peptide of Claim 1, or a composition comprising the peptide.

43. (Withdrawn) A method to stimulate cardiac or skeletal muscle growth in a mammal, comprising administering to a mammal the isolated peptide of Claim 1, or a composition comprising the peptide.

44. (Withdrawn) A method to treat cardiac and skeletal muscle disorders, comprising administering to a patient that has a cardiac or skeletal muscle disorder, the therapeutic protein of Claim 14 or a composition comprising the therapeutic protein.

45. (Withdrawn) The method of Claim 44, wherein said disorder is selected from the group consisting of: dilated cardiomyopathy, Emery-Dreifuss muscular dystrophy, limb-girdle muscular dystrophy, partial lipodystrophy, axonal neuropathy, and mandibuloacral dysplasia.

46. (New) The isolated peptide of Claim 1, wherein the peptide consists essentially of an amino acid sequence that is at least about 85% identical to SEQ ID NO:2.

47. (New) The isolated peptide of Claim 1, wherein the peptide consists essentially of an amino acid sequence that differs from SEQ ID NO:2 by one substitution of an amino acid residue at a position of SEQ ID NO:2 selected from the group consisting of: 1, 2, 5, 6, 9, 10, 11, 12, 13 and 14, wherein the peptide has the biological activity of SEQ ID NO:2.

48. (New) The isolated peptide of Claim 1, wherein the peptide consists essentially of an amino acid sequence that differs from SEQ ID NO:2 by one substitution of an amino acid residue at a position of SEQ ID NO:2 selected from the group consisting of: 1, 2, 5, 6, 9, 10 and 11.

49. (New) The therapeutic protein of Claim 14, comprising a protein comprising an amino acid sequence that is at least about 95% identical to SEQ ID NO:4, wherein the protein has prelamin A or lamin A biological activity, and wherein the protein is chemically or recombinantly attached to a therapeutic agent that increases the half-life of the protein in cardiac or skeletal muscle tissue.

50. (New) The therapeutic protein of Claim 14, comprising a protein comprising an amino acid sequence that is at least about 97% identical to SEQ ID NO:4, wherein the protein has prelamin A or lamin A biological activity, and wherein the protein is chemically or recombinantly attached to a therapeutic agent that increases the half-life of the protein in cardiac or skeletal muscle tissue.

51. (New) The therapeutic protein of Claim 14, comprising a protein comprising an amino acid sequence that is at least about 99% identical to SEQ ID NO:4, wherein the protein has prelamin A or lamin A biological activity, and wherein the protein is chemically or recombinantly attached to a therapeutic agent that increases the half-life of the protein in cardiac or skeletal muscle tissue.

52. (New) The therapeutic protein of Claim 14, comprising a protein comprising an amino acid sequence represented by SEQ ID NO:4, wherein the protein is chemically or recombinantly attached to a therapeutic agent that increases the half-life of the protein in cardiac or skeletal muscle tissue.

53. (New) The processing deficient prelamin A peptide of Claim 38, wherein the processing deficient prelamin A peptide consists essentially of an amino acid sequence that differs from SEQ ID NO:4 by one substitution, deletion or insertion that results in a decrease in said prelamin A or prelamin A pre peptide biological activity.

54. (New) The processing deficient prelamin A peptide of Claim 38, wherein the processing deficient prelamin A peptide consists essentially of an amino acid sequence that differs from SEQ ID NO:4 by one substitution that results in a decrease in said prelamin A or prelamin A pre peptide biological activity.

55. (New) The processing deficient prelamin A peptide of Claim 38, wherein the processing deficient prelamin A peptide consists essentially of an amino acid sequence that is at least 95% identical to SEQ ID NO:4.

56. (New) The processing deficient prelamin A peptide of Claim 38, wherein the processing deficient prelamin A peptide consists essentially of an amino acid sequence that is at least 97% identical to SEQ ID NO:4.

57. (New) The processing deficient prelamin A peptide of Claim 38, wherein the processing deficient prelamin A peptide consists essentially of an amino acid sequence that is at least 99% identical to SEQ ID NO:4.